

## **DYNAMIC BACKUP ROUTING OF NETWORK TUNNEL PATHS FOR LOCAL RESTORATION IN A PACKET NETWORK**

### **ABSTRACT OF THE DISCLOSURE**

A packet network of interconnected nodes employs dynamic backup routing of a Network

5 Tunnel Path (NTP) allocates an active and backup path to the NTP based upon detection of a network failure. Dynamic backup routing employs local restoration to determine the allocation of, and, in operation, to switch between, a primary (also termed active) path and a secondary (also termed backup) path. Switching from the active path is based on a backup path determined with iterative shortest-path computations with link weights assigned based on the cost of using a  
10 link to backup a given link. Costs may be assigned based on single-link failure or single element (node or link) failure. Link weights are derived by assigning usage costs to links for inclusion in a backup path, and minimizing the costs with respect to a predefined criterion. For single-link failure, each link in the active path has a corresponding disjoint link in the backup path. For single-element failure, in addition to backup of the final link in the active path, all links incident  
15 have disjoint bypass links assigned to account for node failure. While intra-demand sharing is used, inter demand sharing may also be provided if complete network information is available to the dynamic backup routing algorithm.